



# International Journal of Obstetrics and Gynaecological Nursing

E-ISSN: 2664-2301  
P-ISSN: 2664-2298  
IJOGN 2022; 4(1): 34-37  
Received: 19-11-2021  
Accepted: 21-12-2021

## Chitra Prajapati

M.Sc. Nursing Final Year  
Student, Faculty of Nursing,  
Rama University, Kanpur,  
Uttar Pradesh, India

## Jasmi Manu

Professor Cum HOD,  
Department of Obstetric and  
Gynaecological Nursing,  
Faculty of Nursing, Rama  
University, Kanpur,  
Uttar Pradesh, India

## Corresponding Author:

### Chitra Prajapati

M.Sc. Nursing Final Year  
Student, Faculty of Nursing,  
Rama University, Kanpur,  
Uttar Pradesh, India

## Role of donor mothers in breast milk banking

Chitra Prajapati and Jasmi Manu

### Abstract

Human milk banking is the process by which breast milk is collected, screened and pasteurized for the use of hospitals or mothers who cannot breastfeed. Human is the best source of nutrition for all newborn babies. More specifically, a mother's breast milk is the first choice of nutrition for those who are preterm, have low birth weight, and are unwell and for those vulnerable infants in the neonatal intensive care unit. Pasteurised donor breast milk is not the same as fresh breast milk as it loses certain bioactive and immunological properties. The ingredients of human breast milk include immunoglobulin and other active constituents that can reduce infection, necrotizing enterocolitis, cardiovascular risk and metabolic disease. If a mother's own breast milk is not available, the second choice should be donor breast milk. Breastfeeding promotion and the collection of donor breast milk are linked. By offering correct information about breastfeeding their infants. It is also known that successful breast feeding significantly reduces neonatal mortality and morbidity world wise. The primary and by far the largest group of consumers of human breast milk are premature babies. Infants with gastrointestinal disorders or metabolic disorders may also consume this form of milk as well. Human breast milk acts as a substitute, instead of formula, when a mother cannot provide her own milk. Human breast milk can also be fed to toddlers and children with medical conditions that include but are not limited to chemotherapy for cancer and growth failure while on formula.

**Keywords:** Donor milk, breast milk, pasteurised milk

### Introduction

In Vienna, Austria, the first human milk bank was created in 1909. Wet nurses aren't always available, and when they are, they lead unhealthy lifestyles and are infected with diseases that can be transmitted through milk. Wet nursing can be replaced with human milk banks.

The Boston Floating Hospital was the world's first breast milk bank, with many more to follow. Human milk banking is no longer practised due to advances in newborn medical care and infant nutrition, especially the creation of high-quality infant formulas. HIV is a relatively recent infectious illness. It is transferred through breast milk, which has caused many milk banks to close. Serological testing of the mother has become mandatory since disease transmission through human milk is now recognised as a health issue. This trend has been reversing since the early 2000s, thanks to better screening of donating mothers and adherence to procedural rules. Vienna, Austria, established the first human milk bank in 1909. Wet nurses aren't always available, and when they are, they lead unhealthy lives and carry diseases that can be transmitted through milk. Wet breastfeeding is not the only option; human milk banking is also a feasible option.

The breasts are a type of breast. Because to a multitude of factors, milk banking activity varies considerably across the globe. The reasons are usually related to economics and funding, but they can also be related to religious and cultural factors. Milk banking is becoming increasingly popular around the world. Many milk banks are being established in India and other Asian nations such as Vietnam, China, and Japan. The rise in interest coincides with big paediatric societies' recommendations to promote human milk feeding in premature newborns, such as ABM, ESPHGAN, and AAP. All rules state that a baby's first food should be his or her mother's milk. If the mother's own milk is unavailable, donor milk is offered as an alternative. Another crucial advice is that donor human milk be obtained from a reputable human milk bank that adheres to strict safety standards.

### Human Milk banking

The main purpose of milk banks is to store donated milk and make it available when it is needed. Milk banks accept donated milk, process it, and store it until it is needed.

Milk from several donors is most typically pooled, however other banks only pool milk from individual donors (single-donor banks). Pasteurization is usually performed on milk delivered by milk banks. Milk is pasteurised and stored frozen in small (100-150 ML) containers for up to a year, depending on local regulations. A processing fee is charged by milk banks in the United States to cover the costs of collecting and managing the milk. The stability of the ingredients of human milk is affected by the container, although colostrums have been observed to be stable when refrigerated for 24 hours in any container.

### Milk Donor

The majority of milk is donated by women who have nursed their own infant for a period of time and have realised that their milk production is sufficient to allow them to donate milk while still meeting their own infant's demands. 6. Nearly half of the women did not work outside the home, and many of them worked in the health and social services professions. The moms' motivations for donating were mostly altruistic, and they had a generally upbeat outlook.

Women must not be using recreational or other drugs to be qualified as milk donors, and both their physician and the infant's physician must agree that milk donation is appropriate. The milk bank will take a medical history and blood samples for testing. HIV-1, HIV-2, human T-cell leukaemia virus 1 and 2, hepatitis B, hepatitis C, and syphilis are usually tested in the donor mother [7]. If all of the prerequisites are completed, the donor is given a supply of milk containers and instructions on how to express milk properly. Before delivering milk to the milk bank, the donor collects milk using a mechanical pump or manual expression and freezes it in the frozen compartment of their home refrigerator.

### Strategies of Milk bank

For the collection and handling of donated milk, milk banks generally follow established procedures<sup>7</sup>. The milk bank instructs donors on suggested breast washing and breast pumping methods. Milk cartons are provided by the bank. Milk is frequently pooled following multiple pumpings. The name, date, and time of expression must be written on each container. Milk is kept at -20 °C in the bank. The donated milk is kept in a refrigerator for overnight thawing the day before it is processed. The milk from 3-5 donors is pooled on the day of pasteurisation. The goal of pooling is to equally distribute nutrients like protein and fat, as well as foreign contaminants. The milk is then separated into individual 100 ML bottles after it has been pooled. Pasteurization is done in a water bath at 62.5 °C for 30 minutes, then quickly cooled. The milk bottles are then kept at -20 °C until they are used. Human milk banks rely on nursing women donating their milk. A nurse screens, counsels, and advises moms who are interested in donating their breast milk about the process and benefits of doing so. With the help of human milk staff, breast milk is collected from donors using manual methods or breast pumps.

### Recipients of Donor Milk

The most common recipients of donor milk are the following:

- Premature infants, especially infants with a birth weight below 1,500 g, because of their high risk of infection and necrotizing enter colitis

- Infants with gastrointestinal anomalies undergoing gastrointestinal surgery leading to short bowel syndrome
- When the mother is temporarily unable to nourish her infant completely, e.g. when the mother is ill or hospitalized
- Weaning from prenatal al nutrition
- Metabolic disorders, especially amino acid disorders
- Before the mother's own milk comes in (first few days after birth).
- Premature infants are not only the largest group of recipients of donor milk, but they are also those who derive by far the greatest benefits from receiving human milk.

### Donor Milk composition

It is commonly acknowledged that the composition of individual expressions of human milk varies substantially, particularly in terms of protein and fat content. As a result, bedside human milk analyzers and processes for nutritional fortification of individual milk samples have become popular. Due to pooling, the heterogeneity of content in donor milk is considerably minimised. The donor mother frequently pools the milk from many pumps before delivering it to the bank. The milk bank then pools milk from various donors, resulting in a protein and fat level of pooled milk that is rather constant and predictable. According to Michelson, fat and protein concentrations fluctuate greatly from one sample to the next, but that variability is dramatically reduced when samples from numerous donors are pooled. The nutrient content of 37 milk pools collected over a two-year period (2003-2005) was evaluated at the Mother's Milk Bank of Iowa. The fat content averaged 39.0 g/L with an SD of 3.51 g/L, whereas the (actual) protein concentration averaged 8.22 g/L with an SD of 0.59 g/L. As a result, the diversity in composition is much lower between individual samples. Low fluctuation is especially advantageous in the case of premature newborns, because protein content variability is frequently the basis of worries regarding excessive protein intake.

### Donor milk v/s Mother Milk

The fact that donor milk is pasteurised, with certain exceptions, has raised worries that part or all of the protective properties of human milk may be lost. As detailed in a review of studies comparing milk components before and after pasteurisation, some essential components of human milk are lowered in concentration or destroyed entirely. Depending on the degree and duration of exposure, heat treatment affects anti-infective and cellular components, growth factors, and some nutrients. Heat affects enzymes the greatest, whereas immunological components are harmed but not totally destroyed. According to her, breast milk is one of the most comprehensive types of nutrition on the earth. Formula does not include the same types of fatty acids as raw milk (though they are quite similar). Antibodies and prebiotics included in breast milk help babies get the good gut bacteria they need for a healthy digestive system. According to the AAP, while donated milk is becoming increasingly common, there is currently insufficient donated milk to meet the needs of premature children.

### Safety of donor Milk

There are some worries regarding the probability of disease pathogen transfer because of the potential for transmission. Disease transmission is extremely unlikely because to modern donor screening and sterilisation of donor milk. In recent decades, there hasn't been a single reported incidence of illness transmission through stored donor milk. It's unclear if the same can be true of informal milk exchanges. Before being offered to preterm newborns, donor milk must be supplemented with nutrients. Donor milk is identical to the mother's own milk in this way. The majority of human milk fortifiers use various fractions or derivatives of cow milk as a protein source. Although proof for that impact is weak, one fortifier delivers protein from human milk and is said to protect better against necrotizing enter colitis than fortifiers containing bovine milk proteins. As a result, the lack of benefit justifies the usage of the high-cost human milk-based fortifier. Breast milk is highly safe to donate since it originates from moms who have pumped more milk than their own baby can consume. Mothers must be screened for any infection that might be transmitted through their breast milk before they can donate milk. Each milk 9s container was checked for dangerous microorganisms as well.

### Donor milk is cost effective or costly

Because milk banks charge a processing fee (\$6-7/100 mL donor milk), it's been questioned if the infants' advantages warrant the cost. Although it is unacceptable to address this issue in the context of life-threatening diseases (necrotizing enterocolitis, sepsis), various studies have shown that donor milk is cost-effective. Donor milk not only saves lives, but it also saves money for the hospital. Breast milk for preterm or unwell newborns is occasionally purchased over the internet, social media, friends, private providers, or other informal sharing arrangements, according to reports. Donor screening, human milk quality control, and shipping norms are all lacking in those circumstances. This is a dangerous behaviour that should not be pursued.

Before being offered to preterm newborns, all donor milk must be supplemented with nutrients. Donor milk is identical to the mother's own milk in this way. The majority of human milk fortifiers use various fractions or derivatives of cow milk as a protein source. Although proof for that impact is weak, one fortifier delivers protein from human milk and is said to protect better against necrotizing enter colitis than fortifiers containing bovine milk proteins. As a result, the lack of benefit justifies the usage of the high-cost human milk-based fortifier.

### Conclusion

Milk banks play an important role in the community by supplying human milk to preterm newborns that would otherwise be unable to obtain it due to a number of factors. Human milk has a significant protective impact on preterm newborns, hence its availability is an essential aspect of quality of care. The usage of donor milk has a lot of support. A human milk bank, also known as a breast milk bank or lactarium, is a service that gathers, filters, processes, and distributes human milk provided by nursing moms who are not biologically related to the receiving child on a prescription basis. Breastfeeding is the best nourishment for newborn newborns for the first year, if feasible. Human milk banks provide a solution for mothers who are unable to

provide their own breast milk to their children for a variety of reasons, including a baby's risk of contracting diseases and infections from a mother who has certain diseases, or when a child is hospitalised at birth due to low birth weight (and thus at risk for conditions such as necrotizing enter colitis), and the mother is unable to provide her own milk during the extended stay due to distance from the hospital.

### Conflict of Interest

The authors certify that they have no involvement in any organization or entity with any financial or non-financial interest in the subject matter or materials discussed in this paper.

### Funding Source

There is no funding Source for this study.

### Acknowledgement

I most sincerely convey my deep sense of gratitude to my guide/Organisation for her/their remarkable guidance and academic support during this study

### References

1. Arnold LDW. Human Milk in the NICU: Policy into Practice. Ontario, Jones and Bartlett Publishers, 2010.
2. Arslanoglu S, *et al.* ESPGHAN Committee on Nutrition: Donor human milk for preterm infants: current evidence and research directions. *J Pediatr Gastroenterol Nutr.* 2013;57:535-542.
3. The Academy of Breastfeeding Medicine: ABM Clinical Protocol #10: Breastfeeding the late preterm infant (34<sup>07</sup> to 36<sup>67</sup> weeks gestation) (first revision June 2011). *Breastfeed Med.* 2011;6:151-156.
4. Eidelman AI, Schanler RJ. Breastfeeding and the use of human milk. *Pediatrics.* 2012;129:e827-e841.
5. Goldblum RM, *et al.* Human milk banking. II. Relative stability of immunologic factors in stored colostrum. *Acta Paediatr Scand.* 1982;71:143-144.
6. Azema E, Callahan S. Breast milk donors in France: a portrait of the typical donor and the utility of milk banking in the French breastfeeding context. *J Hum Lact.* 2003;19:199-202.
7. Human Milk Banking Association of North America (HMBANA): Guidelines for the Establishment and Operation of a Donor Human Milk Bank, 2015.
8. Moro GE, Arslanoglu S. Heat treatment of human milk. *J Pediatr Gastroenterol Nutr.* 2012;54:165-166.
9. Moro GE. V. Processing of donor human milk. *J Pediatr Gastroenterol Nutr.* 2015;61(suppl 1):S6-S7.
10. Goldblum RM, *et al.* Rapid high-temperature treatment of human milk. *J Pediatr.* 1984;104:380-385.
11. Hamprecht K, *et al.* Cytomegalovirus (CMV) inactivation in breast milk: reassessment of pasteurization and freeze-thawing. *Pediatr Res.* 2004;56:529-535.
12. Arslanoglu S, *et al.* Guidelines for the establishment and operation of a donor human milk bank. *J Matern Fetal Neonatal Med.* 2010;23(suppl 2):1-20.
13. Baro C, *et al.* Effect of two pasteurization methods on the protein content of human milk. *Front Biosci (Elite Ed).* 2011;3:818-829.
14. Czank C, Simmer K, Hartmann PE. Simultaneous pasteurization and homogenization of human milk by combining heat and ultrasound: effect on milk quality. *J*

- Dairy Res. 2010;77:183-189.
15. Permanyer M, *et al.* Maintenance of breast milk Immunoglobulin A after high-pressure processing. *J Dairy Sci.* 2010;93:877-883.
  16. Grøvslien AH, Grønn M. Donor milk banking and breastfeeding in Norway. *J Hum Lact.* 2009;25:206-210.
  17. Ronnestad A, *et al.* Late-onset septicemia in a Norwegian national cohort of extremely premature infants receiving very early full human milk feeding. *Pediatrics.* 2005;115:e269-e276.
  18. Lawrence RA, Lawrence RM. *Breastfeeding: A Guide for the Medical Profession*, ed 7. Missouri, Elsevier, 2010.
  19. Schanler RJ, Shulman RJ, Lau C: Feeding strategies for premature infants: beneficial outcomes of feeding fortified human milk versus preterm formula. *Pediatrics.* 1999;103:1150-1157.
  20. Meinen-Derr J, *et al.* Role of human milk in extremely low birth weight infants' risk of necrotizing enterocolitis or death. *J Perinatol.* 2009;29:57-62.
  21. Patel AL, *et al.* Impact of early human milk on sepsis and health-care costs in very low birth weight infants. *J Perinatol.* 2013;33:514-519.
  22. Davanzo R, *et al.* Breastfeeding at NICU discharge: a multicenter Italian study. *J Hum Lact.* 2013;29:374-380.
  23. Arslanoglu S, *et al.* Presence of human milk bank is associated with elevated rate of exclusive breastfeeding in VLBW infants. *J Perinat Med.* 2013;41:129-131.
  24. Tully MR. A year of remarkable growth for donor milk banking in North America. *J Hum Lact.* 2000;16:235-236.
  25. Merhav HJ, *et al.* Treatment of IgA deficiency in liver transplant recipients with human breast milk. *Transpl Int.* 1995;8:327-329.
  26. Rough SM, *et al.* Qualitative analysis of cancer patients' experiences using donated human milk. *J Hum Lact.* 2009;25:211-219.
  27. Michaelsen KF, *et al.* Variation in macronutrients in human bank milk: influencing factors and implications for human milk banking. *J Pediatr Gastroenterol Nutr.* 1990;11:229-239.
  28. Cooper AR, *et al.* Macronutrient content of donor human breast milk. *Arch Dis Child Fetal Neonatal Ed.* 2013;98:F539-F541.
  29. Lavine M, Clark RM. Changing patterns of free fatty acids in breast milk during storage. *J Pediatr Gastroenterol Nutr.* 1987;6:769-774.
  30. Schmidt E. Effects of varying degrees of heat treatment on milk protein and its nutritional consequences. *Acta Paediatr Scand Suppl.* 1982;296:41-43.